Mobile Incident Command Center

Surveying for Oil in the Mississippi Sound

6067982

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Table of contents

1 Introduction and Purpose

It is believed that certain mechanisms exist whereby oil could potentially be mobilized below the water surface (referred to in this document as “submerged oil”) or whereby oil may mix with sand in the sub-tidal and nearshore areas, making it denser than water, and allowing the mixture to sink and accumulate (referred to as sunken oil); See Figure 1 for oil and area definitions. Oil, if present, may represent a potential source of re-oiling to beaches and/or have potential impacts to sensitive resources. This survey was developed in order to evaluate and delineate the existence of submerged or sunken oil in the Mississippi Sound.

The primary purpose of this document is to describe the procedures and methods that will be used to sample and delineate anomalies in the Mississippi Sound. The Mississippi Sound extends from Waveland, Mississippi, to the Dauphin Island Bridge, a distance of about 90 miles. The sound is bordered on its southern edge by the barrier islands - Cat, Ship, Horn, Petit Bois and Dauphin Islands - which are part of the National Park Service's Gulf Islands National Seashore. Those islands separate the Sound from the Gulf of Mexico.

This document was developed in close coordination with Mississippi Department of Environmental Quality (MDEQ) as part of the MC252 Incident response. Both the Mississippi Incident Commander (IC) and Alabama IC and their staff provided assistance in developing these procedures and tactics. The U.S. Environmental Protection Agency, National Oceanographic and Atmospheric Administration also provided review. This procedure will be revised as needed as operations

2 Survey Overview

This procedure includes three separate and unique tactics that are expected to be employed to investigate the existence of submerged oil in the Mississippi Sound.

- Tactic #1 - Sorbent Probes Deployment and Water Sampling
- Tactic #2 - Fluorometer Readings and Water Sampling
- Tactic #3 - Sediment Grabs

In addition, if new or alternative technologies are identified, they will be considered for application as appropriate.

Vessels included in this survey are grouped into two distinct roles: 1) **survey vessels** which will search for anomalies, and 2) **sampling vessels** which will be staffed with qualified sampling technicians assigned with the task of collecting samples.

It is anticipated that the activities described in this procedure will continue for a maximum of 14 days unless conditions warrant additional effort. Data and observations will be evaluated regularly during the operational periods to determine if the level of effort is appropriate.

2.1 Survey Coverage and Locations

The Mississippi Sound is the area of coverage for this survey. The Sound is defined for this survey as follows:

- Western boundary: Hancock County Division 1, just west of Heron Bay
- Southern boundary: line drawn approximately through the longitudinal barrier islands
- Northern boundary: shoreline of the mainland.
- Eastern boundary: approximate location where Dauphin Island bridge meets Mobile Bay, not to include Mobile Bay.

2.2 Safety and Resource Considerations

The safety of individuals is of utmost importance in this operation. Operations will not be conducted when weather and sea state conditions are unsafe. Additionally, crew members will monitor the position of the survey vessel in relation to the surf, sensitive resources, depth, and other mariners to maintain a safe and environmentally sound survey.

3 Surveying Tactic #1 – Sorbent Probe and Water Sampling

3.1 Tactic Description

Vessels will be tasked with deploying sorbent probes to evaluate anomalies in the water column or on the seafloor. Sorbent probes will consist of a line marked in depth increments with a sorbent pad clipped to the base of the line just above a small (4 to 10 ounce) weight (fishing weight, e.g.). Probes are intended to absorb subsurface oil when encountered.

To provide complete geographic coverage for this effort, the Mississippi Sound will be divided into geographical areas that are 2 minutes (approximately 2 miles) of latitude in length by 2 minutes (approximately 2 miles) of longitude in width (an area of approximately 4 square miles). This grid formation will create approximately 180 distinct areas of approximately equal size that will be thoroughly surveyed for the presence of submerged oil in the water column. The graphic provided in Figure 2 illustrates the locations of the survey areas. Detailed area maps will be provided to the survey and sampling vessel teams. The vessel will travel at a speed that is conducive for the vessel and monitoring equipment to readily detect the presence of oil if encountered.

3.2 Surveying Vessel

It is expected that approximately 28 survey vessels from Mississippi and 8 survey vessels from Alabama will be assigned to this project from the Vessels of Opportunity (VoO) Program. The vessels will follow a zigzag or serpentine path throughout each survey area to ensure the entire area is surveyed and to maximize the likelihood of identifying anomalies in the water column (See Figure 2). The surveying vessel will deploy sorbent probes at ½ mile intervals along the

survey route and also when anomalies are observed as directed by Mississippi Air Operations as coordinated with VoO operation dispatchers at the Biloxi MC-252 Incident Branch Office.

Surveying vessels will be sufficiently equipped to enable the crew to reasonably detect anomalies, deploy and retrieve sorbent probes, and conduct a thorough field characterization to determine whether potential oil is present in the water column. This may include sonar instrument (depth finder) for identifying anomalies or a "false bottom."

3.3 Sampling Vessel

It is expected that 6 sampling vessels from Mississippi, staffed by MDEQ sample personnel and 1 sampling vessel from Alabama which may be assigned from the VoO program or may be agency-owned will be utilized during this tactic. The primary task of the sampling vessel is to collect samples from any anomaly identified by the surveying vessels. Each sampling vessel will be outfitted with a sampling team consisting of at least 2 technicians. The operation and use of the sampling equipment and instruments will be at the discretion of sampling technicians. The sampling vessel will be on standby to sample the location of anomalies as identified by the survey vessel.

3.4 Water Survey Techniques

Water surveys will be completed using the following methods. A schematic of the order and flow of the procedures is attached as Figure 3.

3.4.1 Water Screening

The surveying vessel will deploy sorbent probes at ½ mile intervals along the survey route and also when anomalies are observed as directed by Mississippi Air Operations as coordinated with VoO operation dispatchers at the Biloxi MC-252 Incident Branch Office.

When an anomaly is observed or a specified sampling interval has been reached, the survey team will record the GPS coordinates of its location with an electronic data collector (transmits data real-time to Situation Unit) and on a backup hard copy data sheet, and will and drop a marker buoy to mark the physical location of the sorbent probe effort for that location. The survey crew will then slowly lower a sorbent probe into the water until the sorbent probe reaches the anomaly (water column or near the sea floor). The probe will be drawn slowly through the water column from the top of the column to the sea floor and then retrieved to the vessel. The probe will then be raised slowly back to the vessel. If no oil is observed on the sorbent probe, the marker buoy will be retrieved and the vessel will continue on its original course. If the probe indicates that potential submerged oil is present, the survey team will contact the sampling team via marine radio or cell phone and await their arrival. While waiting for the sampling team the survey crew will attempt to determine the extent of the potentially oiled area, document all findings, and initiate decontamination activities (if necessary – See Section 3.6). After the arrival of the sampling vessel, the survey vessel will advise the sampling vessel of the extent of the potentially oiled area and then move to another location.

If electronic data collectors experience technical difficulties or stop working, survey crew will collect hard copy data sheets at the end of the day and transmit them to their supervisors for communication to Situation Unit.

3.4.2 Water Sample Collection

When sampling vessels are dispatched to investigate an anomaly, water screening will be completed at the site of the anomaly. Upon arrival at the site, the sample vessel will initiate sample collection activities. Aliquots of water will be collected using a discrete water sampling device (e.g., Kemmerer bottle) starting at 0.5m and then at 1.0m intervals to a 3m depth, and then at 2.0 m intervals with a final sample taken 0.5m from the bottom (or at level indicated by depth finder). At each level the sample will be poured onto an absorbent pad that is placed in a clear glass jar. The pad will then be inspected for any visible presence of potential oil. If potential oil is observed on the pad, a photo will be taken of the absorbent pad, and it will be retained until the depth intervals are sampled for that location. Once all of the depth intervals are sampled, all pads will be inspected. If pads show no potential oil material, this information will be noted in field logbooks and/or electronic data collectors, and all pads retained for archiving by placing in individual plastic bags labeled with date, time, location, depth and sampler. If potential oil is identified on one or more pads, the pad from the depth showing the greatest amount of potential oil will be collected for laboratory analysis. It will be wrapped in foil and placed in a plastic bag labeled with date, time, location and depth, sampler, and photo number, and stored at 4±2 C for subsequent analysis for the presence of Oil Range Organics (ORO). All other pads will also be retained for archiving as described previously. Then, water will be screened using the same device (e.g., Kemmerer bottle) and procedures, at 100 meter increments north, south, east, and west of the site in order to characterize the size of the affected area. Once this screening is complete at these sites and the size of the submerged oil is delineated, the location of the greatest amount of potential oil shown on the pad will be identified. At this location, water column profiles will be taken with a multi-parameter water probe and water samples will be collected from the depth of the pad which showed the greatest amount of potential oil (see Section 3.4.2).

Immediately after any water sample containers are filled, the samples for petroleum and dispersant analyses will be placed into a cooler on ice (4±2 C). Phytoplankton sample jars will be loosely closed and will be placed into a separate cooler without ice. Water samples will be managed under strict chain-of-custody (COC) procedures established for the project in the *MC-252 Nearshore Water and Sediment Sampling Analysis Plan* (Annex 1) and will be transported daily by courier to the project laboratory.

3.4.3 Multi-Parameter Water Probe

As described in Section 3.4.2 above, the sampling vessel will characterize the water from the location of the greatest amount of potential oil shown on the absorbent pad. Field parameters will be measured using a multi-parameter water probe (YSI Professional Plus or similar instrument). Parameters will be measured by deploying a probe from the side of the boat. Water quality parameters will be recorded after allowing the probe to equilibrate for 30 seconds

or until readings have stabilized. Measurements of pH, temperature, conductivity, and dissolved oxygen will be recorded.

3.5 Laboratory Analysis

All laboratories will follow the standard protocols and procedures as described in the *MC-252 Nearshore Water and Sediment Sampling Analysis Plan (Annex 1)*, and the Deepwater Horizon *Quality Assurance Project Plan (Annex 2)*. Samples will be analyzed for volatile organic compounds (VOCs), propylene glycol, 2-butoxy ethanol, 2-ethylhexanol, semi-volatile organic compounds (SVOCs), gasoline range organic compounds (GRO), diesel range organic compounds (DRO), and oil range organic compounds (ORO). In addition, a sample will be collected at each sampling site for potential phytoplankton analysis. The specific analytical methods to be followed are described in Table 1.

Table 1: Sample Parameters, Methods and Container Types

Parameter	Method	Container Type and Size
VOC (water)	EPA 8260	3 x 40 mL VOA vials HCL to pH < 2
SVOC/ PAH (water)	EPA 827	2x 1 L Amber Glass
DRO/ORO (water)	EPA 8015B	1 x 1 L Amber Glass
GRO (water)	EPA 8015	2 x 40 mL VOA vials HCL to pH < 2
2-Ethylhexanol (water)	EPA 8260	Included in VOC above
2- Butoxy Ethanol (water)	EPA 8270	Included in SVOC above
Propylene Glycol (water)	EPA 8015/ 8270	Included in above
Phytoplankton	Relative abundance and count, by biologist enumeration	1 L clear glass, no preservative needed; using local laboratory

Fingerprinting or additional analysis may be performed on a sample (e.g., source fingerprinting) if warranted or as requested by the Operations Section or Unified Command.

3.6 Documentation and Notification

All vessels will record all appropriate data in both the electronic data collectors and hard copy datasheets provided for the effort.

Notifications of potential oil areas will take place as follows. If areas of potential oil are identified during surveying and sampling, this information is automatically electronically communicated real-time to the Situation Unit per the data forms that reside in the units. If the

electronic data collectors experience technical difficulties or stop working, the survey team will collect the hard copy data sheet and will fill out the Situation Team Reporting Sheet, provided in Annex 3, and will transmit these to their supervisors at the end of the day for incorporation into daily Situation Unit briefs.

It is anticipated that the surveying/sampling activities for this tactic will continue for a maximum of 14 days unless conditions warrant additional effort, as determined by Unified Command. Data and observations will be evaluated regularly during the operational periods to determine if the level of effort is appropriate.

4 Surveying Tactic #2 – Fluorometer Readings and Water Sampling

4.1 Tactic Description

Vessels will be tasked with towing a submersible fluorometer in the water column of the Mississippi Sound to continuously monitor for oil plumes. Accurate GPS data will be coupled with real time fluorometer data to provide reasonable positional data for fluorometer readings. Each vessel will tow the fluorometer instrument at a speed not to exceed 4 knots. It is expected that the combination of probe, weights and buoy will be established to sink the probe to approximately mid-depth of the water column, avoiding the last 4 feet of depth in order to avoid the bottom. The proper setup, calibration, and operation of the fluorometer will be established by strict adherence with the manufacturer's procedures. When the surveying vessel identifies an anomaly as indicated by pre-established markers, a water sample will be collected by onboard technicians at the approximate depth of the fluorometer's reading, as described in Section 4.4, below.

4.2 Survey vessels

Alabama – One VoO will be tasked with towing the fluorometer along a specified course from the Mississippi state line to the Dauphin Island Bridge. The graphic provided in Annex 2 illustrates the approximate locations of the area to be surveyed. Site specific survey area maps will be provided to the sampling teams.

Mississippi - One VoO will be tasked with towing the fluorometer along a specified course from the Alabama state line to the western boundary of Hancock County, Mississippi. The graphic provided in Annex 2 illustrates the approximate locations of the area to be surveyed. Site specific survey area maps will be provided to the sampling teams.

4.3 Data Acquisition

Several parameters will be continuously measured, displayed and recorded by the fluorometer in real time. This data includes pH, conductivity, temperature, dissolved oxygen. This information will be extracted from the instrument and stored on a PC or web-based system.

4.4 Sample Collection

Sampling technicians aboard the VoO will collect samples from anomaly locations and depths as identified by the fluorometer as identified by a pre-established threshold. Each vessel is expected be outfitted with a sampling team consisting of at least 2 technicians. Water sample analysis will proceed for the same parameters as described above in Section 3.5.

4.5 Documentation

All vessels will record all appropriate data in the electronic data collectors, logbooks, and computer logging mechanisms associated with the fluorometer and GPS devices.

Notifications of potential oil areas will take place as follows. If areas of potential oil are identified during surveying and sampling, this information is automatically electronically communicated real-time to the Situation Unit per the data forms that reside in the units. If the electronic data collectors experience technical difficulties or stop working, the survey team will collect the logbook sheets and will fill out the Situation Team Reporting Sheet, provided in Annex 3, and will transmit these or copies of these to their supervisors at the end of the day for incorporation into daily Situation Unit briefs.

It is anticipated that the surveying/sampling activities for this tactic will continue for a maximum of 14 days unless conditions warrant additional effort, as determined by Unified Command. Data and observations will be evaluated regularly during the operational periods to determine if the level of effort is appropriate.

5 Surveying Tactic #3 – Sediment Grabs

5.1 Tactic Description

Vessels will be tasked with traveling a specified course in the Mississippi Sound and deploying a surface sediment grab sampler (e.g., Ponar device) to collect samples at specified locations. When the vessel reaches the specified sampling point, the sampling team will record the GPS coordinates of its location and drop a marker buoy. The vessel will proceed to collect a sediment sample as described in Section 4.1 and attempt to determine whether the material observed is oil. If the sediment sample indicates that sunken oil may be present, the survey team will estimate the size of the anomaly using visual or other means (e.g., additional Ponar drops). After determining and marking the extent of anomaly, the survey crew will document all findings, initiate decontamination activities (if necessary), notify Situation Unit per instructions in Section 5.4, then continue along the specified course.

5.2 Survey vessel

5.2.1 Alabama – One VoO will be tasked with deploying a surface sediment sampler (e.g. Ponar device) and collecting samples at specified locations along a specified course from the Mississippi state line to the Dauphin Island Bridge. The graphic provided in Annex 2 illustrates the approximate locations of each area to be sampled. Detailed maps will be provided to the sampling teams.

5.2.2 Mississippi - One VoO will be tasked with deploying a surface sediment sampler (e.g. Ponar device) and collecting samples along a specified course from the Alabama state line to the western boundary of Hancock County, Mississippi. The graphic provided in Annex 2 illustrates the approximate locations of each area to be sampled. Detailed survey area maps will be provided to the sampling teams.

5.2.3 Sediment Sample Collection

Bottom surface material will be collected by a stainless steel surface grab sampler (e.g. Ponar device. The surface grab material will be visually inspected to evaluate whether it contains oil material. If the material is believed to be oil or contain oil, a sample of the material will be collected per the instructions specified in Section 5.0. If the material does not appear to contain potential oil then the material will be deposited back into the water. In either case, visual details and physical characteristics will be noted in the field sampling logbook and/ or electronic data collector and photographs will be taken. Details will include color, consistency, odor, or other relevant visually evident characteristics. Material collected with the sampling device will be evaluated by the field team for acceptability using the following criteria:

- The sampler is not overfilled
- The overlying water is not excessively turbid
- The sediment surface is relatively undisturbed
- An adequate penetration depth is obtained (i.e., to enable sampling of the undisturbed surface sediment), and
- Oil is determined to be present

If a sample fails to meet any of the above criteria, it will be rejected and discarded.

If a layer of submerged oil is observed in the sediment grab, a description of the top layer should be recorded and a photograph taken before it is disturbed. After a sediment sample is judged to be acceptable, any overlying water will be decanted off.

A representative sample of the material field identified as petroleum will be placed directly into a laboratory supplied 4 ounce glass jar, labeled and stored on ice. The sample will be retained for FTIR analysis and/or fingerprinting at the request of the Mobile Sector Environmental Unit Leader.

5.3 Fourier Transform Infrared (FTIR) Spectroscopy

Samples that have been collected during the survey may be transported to an onshore location and analyzed using a Fourier Transform Infrared Spectroscopy instrument. The FTIR will be used to compare the spectrum of the material to a library of known compounds. If the FTIR confirms that oil is present, then the sample may be retained for additional analysis as discussed in Section 6.0. If the FTIR shows that no oil is present, no additional analysis will be performed and the sample will be discarded. All standard chain-of-custody protocols, holding times, and preservation requirements should be maintained on all samples that undergo FTIR analysis.

5.4 Sample Handling Procedures

Samples of material that is believed to contain submerged oil will be placed in laboratory-supplied glass containers (as designated in Table 2), labeled with sample identification number, sample location, sampler name, time of sample collection, sample date, and analysis and methodology requested. Samples will be immediately placed in a cooler on ice pending laboratory analysis. Samples will be packaged, labeled, retained on ice, and documented in an area which is free of impact and provides for secure storage. Custody seals will be placed on each sample-containing cooler, and chain-of-custody procedures will be maintained from the time of sample collection until arrival at the laboratory to protect sample integrity. Samples will be delivered by courier to a National Environmental Laboratory Accreditation Conference (NELAC) certified laboratory for analysis. Refer to the existing Quality Assurance Project Plan for specific requirements, as appropriate.

5.5 Laboratory Analysis

Sediment samples may be analyzed for the parameters listed in Table 2. It is expected that all samples will undergo the FTIR examination to confirm the field identification of oil in each sample. Samples will undergo fingerprinting at the request of the Mobile Sector Environmental Unit Leader.

Table 2: Sample Parameters, Methods and Container Types

Parameter	Method	Container Type and Size
Hydrocarbon Verification	FTIR	4 oz glass jar
MC 252 Fingerprinting	GC/MS	4 oz glass jar

The suite of analyses for sand/sediment samples may be revised based on input from regulatory agencies involved in the project.

5.6 Documentation

All vessels will record all appropriate data in the electronic data collectors and logbooks for the effort.

Notifications of potential oil areas will take place as follows. If areas of potential oil are identified during surveying and sampling, this information is automatically electronically communicated real-time to the Situation Unit per the data forms that reside in the units. If the electronic data collectors experience technical difficulties or stop working, the survey team will collect the logbooks and will fill out the Situation Team Reporting Sheet, provided in Annex 3, and will transmit these or copies of these to their supervisors at the end of the day for incorporation into daily Situation Unit briefs.

It is anticipated that the surveying/sampling activities for this tactic will continue for a maximum of 14 days unless conditions warrant additional effort, as determined by Unified Command. Data and observations will be evaluated regularly during the operational periods to determine if the level of effort is appropriate.

6 Decontamination and Waste

6.1 Decontamination

Decontamination procedures refer to the steps undertaken to minimize the potential for offsite contamination and cross-contamination between sampling locations. All decontamination procedures will be in accordance with the *MC-252 Nearshore Water and Sediment Sampling Analysis Plan (Annex 1)*.

6.1.1 Water Sampling

Water sampling media (excluding sensitive instruments such as the fluorometer and multi-probe) will receive a gross decontamination to remove visible oil residue using a bristled brush and a solution comprised of a laboratory grade, non-phosphate detergent (e.g., Alconox or Liquinox) and potable water. The decontamination of sampling equipment will be conducted if it contains potential oil. Decontamination of potentially oiled equipment will occur over plastic sheeting or over plastic buckets onboard the surveying vessel or at another designated area. The sampling equipment to be decontaminated will be washed using a bristled brush and the detergent solution. The items will then be rinsed with potable water. Decontaminated items will be secured in cleaned containers for transit to the next sampling location. Equipment should be decontaminated before each sampling event.

Nitrile gloves will be worn by sampling personnel and changed between activities at each discrete sample collection location. Previously worn nitrile gloves will be discarded in appropriate waste receptacles with other personal protective equipment.

6.1.2 Fluorometer and Multiprobe

Typical decontamination procedures for the fluorometer and multiprobes will be followed. It is expected that these instruments will be decontaminated in the field after each day's activities, including rinsing with distilled or deionized water, sprayed with a laboratory grade, non-

phosphate detergent solution, wiped gently with an appropriate clean cloth material or brush, and then rinsed again with distilled or deionized water.

6.1.3 Sediment Grabs

Decontamination for sediment grabs will be consistent with those described above for water samples in Section 6.1.1. When sampling equipment (e.g. Ponar) is used to determine the size of a submerged oil zone, decontamination of equipment between individual drops is not required. It is at the discretion of the sampling team to determine when decontamination of equipment is warranted.

6.2 Waste

With the exception of waste generated by the decontamination process, the proposed sediment sampling event is anticipated to generate very little waste. All material collected using the sorbent probe and not submitted as part of the sample will be returned to the area of sample collection (i.e. Gulf of Mexico). All potentially oiled sorbent material will be properly bagged and onboard the boat. When demobilizing for the day, (or at the end of the field effort), bagged potentially oiled sorbent material need to be properly disposed of per oiled waste management procedures. The method for storage and disposal of the waste materials will comply with applicable local, state and federal regulations.

7 Data Review and Reporting Analysis

The results of the oil surveys will be provided to the appropriate Operations Section as soon as possible to allow for a determination regarding cleanup operations. Data identifying the sampling locations and presence or absence of oil will be transmitted daily to Operations. If the oil is identified, **immediately contact the Situation Unit Hot Line 251-445-3333.**

8 Records Management

Records management refers to the procedures for generating, controlling, and archiving project-specific records and records of field activities. Project records, particularly those that are anticipated to be used as evidentiary data, directly support current or ongoing technical studies and activities, and provide historical evidence needed for later reviews and analyses, will be legible, identifiable, retrievable and protected against damage, deterioration, or loss on a centralized electronic database. Handwritten records will be written in indelible ink. Records will likely include, but are not limited to, the following: bound field notebooks on pre-numbered pages, sample collection forms, personnel qualification and training forms, sample location maps, equipment maintenance and calibration forms, chain-of custody forms, maps and drawings, transportation and disposal documents, reports issued as a result of the work, procedures used, correspondences, and any deviations from the procedural records. Documentation errors will be corrected by drawing a single line through the error so it remains legible and will be initialed by the responsible individual, along with the date of change, and the correction will be written adjacent to the error.

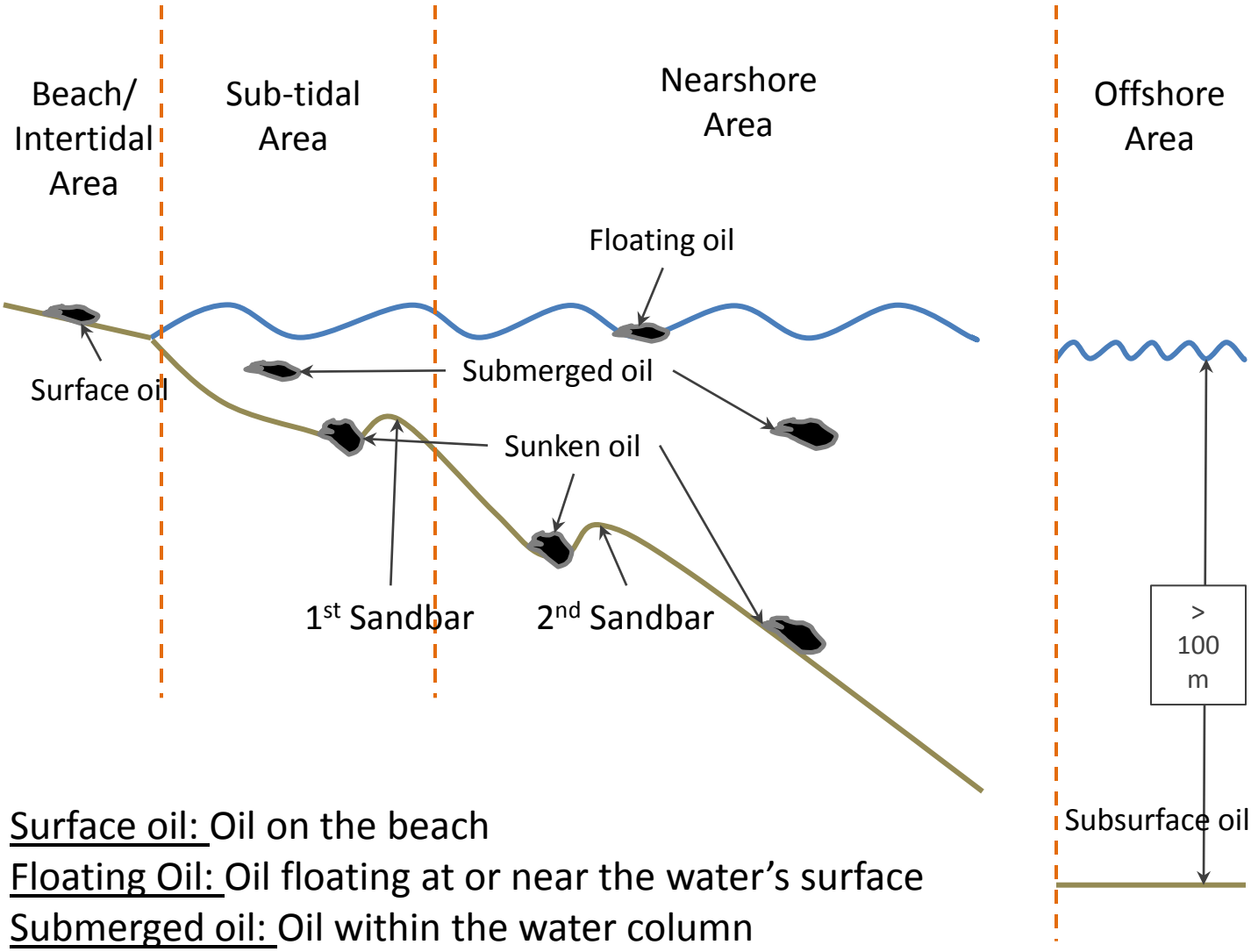
9 Wildlife Protection

The Best Management Practice (BMP) checklist for on-water operations applies to this procedure (Annex 4). The checklist was prepared use by Operations Section during response activities by 1) providing guidance on how to comply with endangered species act BMPs and 2) documenting compliance. This document is to be filled out for each operational period and correspond with each ICS 204 (Work Assignment).

In accordance with all response activities, if oiled, distressed, or dead wildlife are encountered, survey or sampling crews will contact the Wildlife Hotline at 866-557-1401.

Figure 1: Oil and Area Definitions

Oil and Area Definitions



Surface oil: Oil on the beach
Floating Oil: Oil floating at or near the water's surface
Submerged oil: Oil within the water column
Sunken oil: Oil on the sea floor bottom and/or mixed in with bottom sediments

Beach/Intertidal Area: Beach above mean low water
Sub-tidal Area: Mean low water to approximately the outer edge of first sandbar
Nearshore Area: Seaward from approximately the outer edge of first sandbar
Offshore Area: Generally waters deeper than 100 meters

Figure 2: Survey Graphic

Figure 2: Survey Graphic

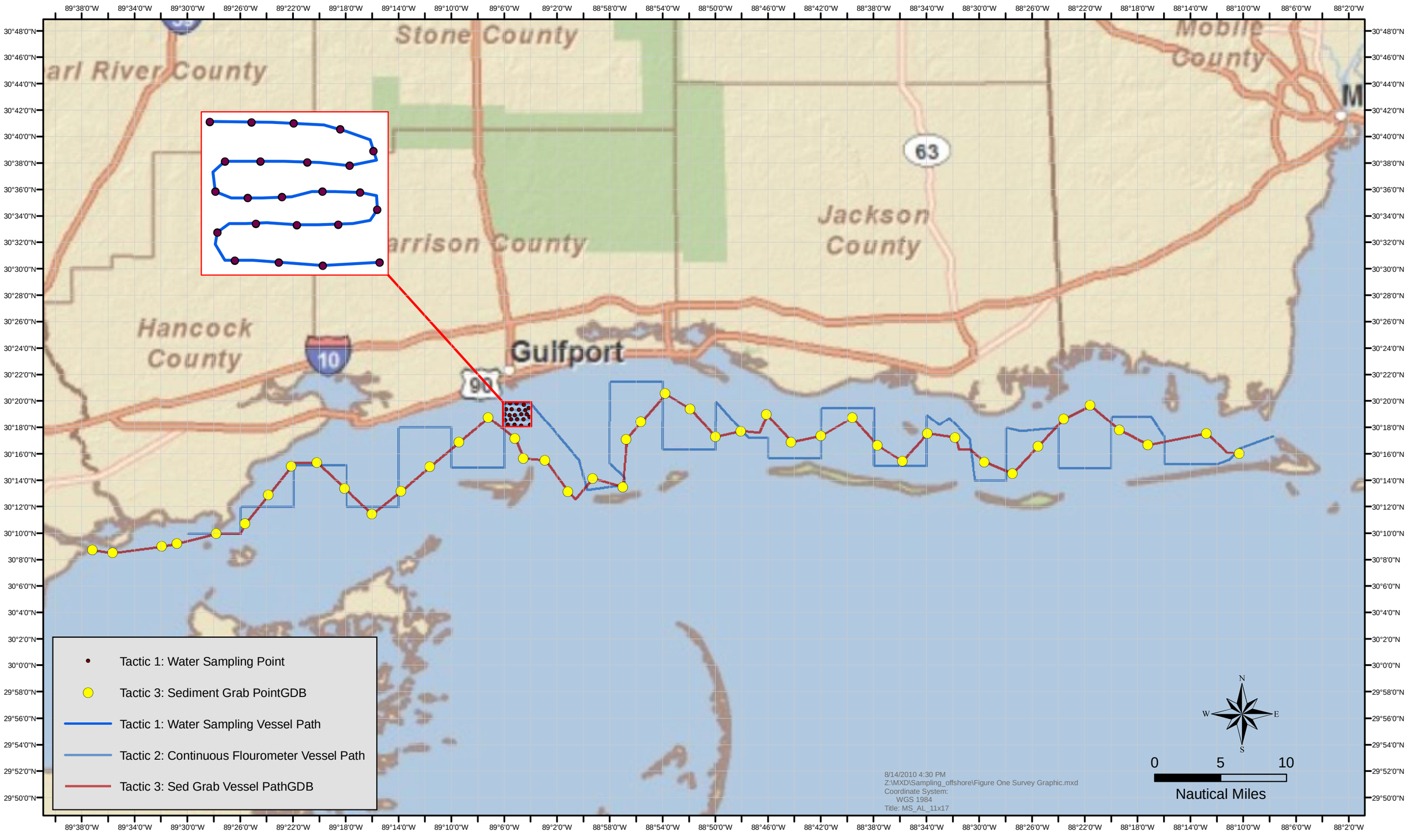
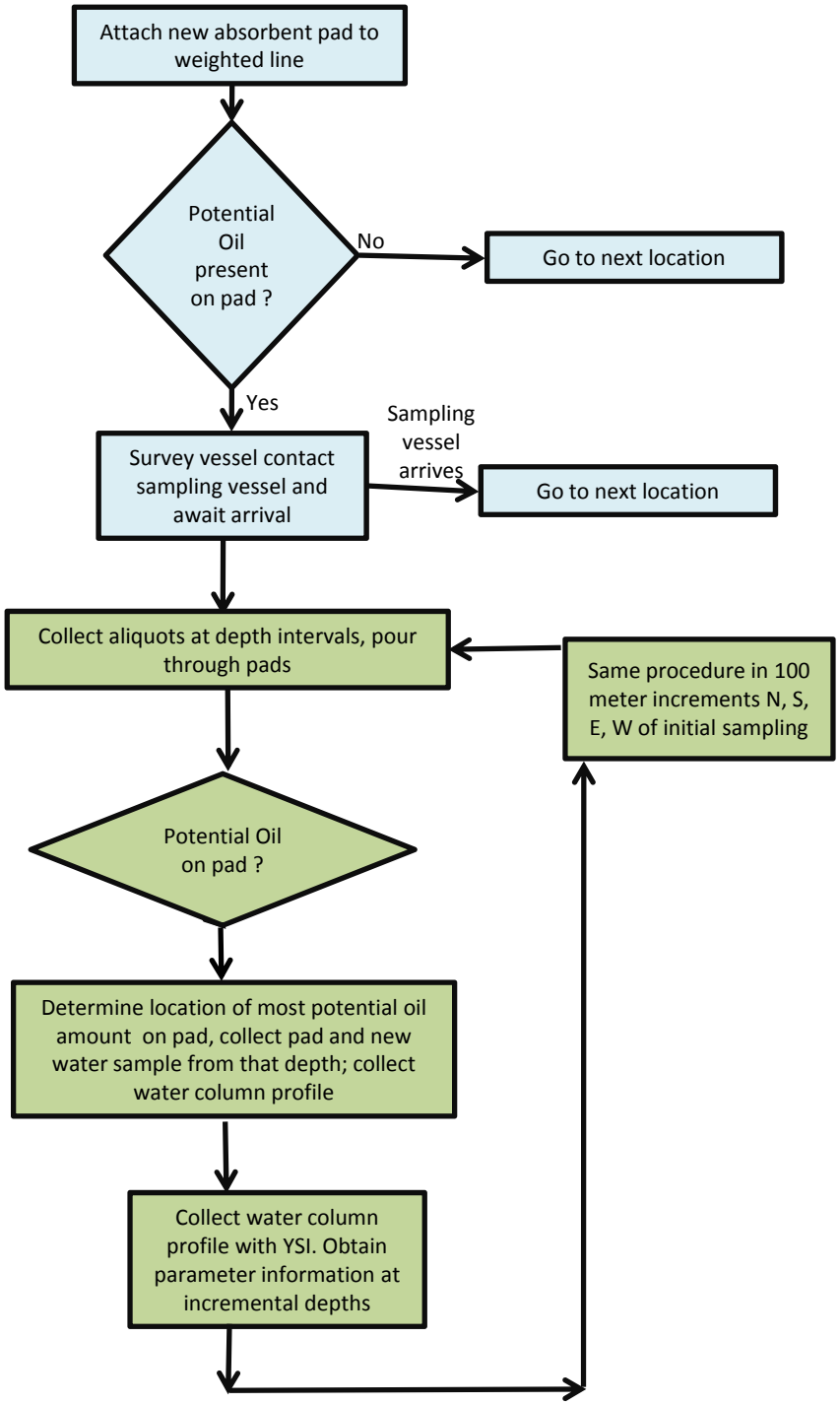


Figure 3: Water Sample Screening and Collection Schematic

Water Sample Screening and Collection Schematic



Legend:

= Action

= Decision Point

= Survey vessel

= Sampling vessel

Annex 1: Nearshore Water and Sediment Sampling and Analysis Plan

Deepwater Horizon (MC-252) Incident
MOBILE LOCATION
Please write in BLUE ink only

Name of Plan:	MC 252 Incident Near Shore Water and Sediment Sampling and Analysis Plan, Mobile Sector
Section:	Planning, Environmental
Submitted By: (Name, Signature & Date)	Planning/Environmental Unit/CTEH (JMcM) James A. Pfeiffer, E.U. Lead 6/6/10
Reviewed by Planning Chief/ Deputy: (Name, Signature & Date)	Charlene C. Chuang 6/7/10

Approved by:

RPIC (Name, Signature & Date)	6/07/10
FOSCR (Name, Signature & Date)	6/10/10
SOSC-MS (Name, Signature & Date)	Richard Harrell 06/07/10
SOSC-AL (Name, Signature & Date)	Philip S. Woops 06/08/10
SOSC-FL (Name, Signature & Date)	6-8-10
IC-DOI (Name, Signature & Date)	6-8-10
IC-EPA (Name, Signature & Date)	Terry Stilman 6/7/10

This plan has also been reviewed and agreed by:

Agency/ Team/ Name: (Name, Signature & Date)	Alabama – ADEM
Agency/ Team/ Name: (Name, Signature & Date)	Florida - FDEP George Henderson George E Henderson 6/6/2010
Agency/ Team/ Name: (Name, Signature & Date)	Mississippi - MDEQ Barbara Vinskup Barbara Vinskup 6/7/2010
Agency/ Team/ Name: (Name, Signature & Date)	

Deepwater Horizon (MC-252) Incident
MOBILE LOCATION
Please write in BLUE ink only
Original Plan Submittal & Copy Distribution

Name of Plan:	MC 252 Incident Near Shore Water and Sediment Sampling and Analysis Plan, Mobile Sector
Submitted By: (ICS Position, Signature & Date)	Planning, Environmental
Owner/Author Environmental Lead/Depty Signature	Planning/Environmental Unit/CTEH (JMcM) James A. Pfeiffer, E.U. Lead 6/6/10

Distributing Copies To:
(to be completed by person submitting plan and verified by Planning Chief or Deputy)

Section/ Unit	**# Copies**	**Received by** (ICS Position, Signature, Date)
Environmental Unit	3	
Coast Guard		
Mississippi 1 Incident Commander 1 MDEQ	2	
Alabama 1 Incident Commander 1 ADEM	2	
Florida 1 incident Commander 1 MDEQ	2	
EPA		

Near Shore Water and Sediment Sampling and Analysis Plan

Deepwater Horizon (MC-252) Crude Oil Spill

June 6, 2010

Prepared For:
Sector Mobile Incident Command

Prepared By:
Center for Toxicology and Environmental Health, L.L.C.
5120 North Shore Drive
North Little Rock, AR 72118

1.0 Introduction and Purpose

This Work Plan was prepared by Center for Toxicology and Environmental Health, L.L.C. (CTEH), on behalf of Sector Mobile Incident Command (IC), and describes the sampling and analysis activities proposed to determine if migration of oil or petroleum constituents from crude oil releases in the Gulf of Mexico have migrated to near shore areas of the coast between Bay Saint Louis, MS and Panama City, FL.

The purpose of this sampling and analysis plan (SAP) is to guide near shore water sampling along a line approximately three miles from the coast line through Mississippi and Alabama state waters and at approximately nine miles from the coast line through the represented portion of Florida's waters to determine whether or not near shore water is affected by the crude oil spill and evaluate water quality. Sample locations will be established at regular intervals. Sampling areas may be expanded or reduced, as needed, based on the results of consecutive sampling events or the identification of other sources.

This work plan will additionally address sampling of coastal sediments on a random basis in near shore areas. Areas may be targeted based on input from individual states.

Near shore water and sediment samples will be analyzed for volatile organic compounds (VOCs), semi-volatile organic compounds (SVOCs), propylene glycol, 2-butoxy ethanol, gasoline range organic compounds (GRO), diesel range organic compounds (DRO), oil range organic compounds (ORO), Target Analyte List (TAL) metals, and mercury. This plan will officially be implemented after approval by USEPA Region IV and regulators from Mississippi, Alabama, and Florida.

2.0 Sampling, Methods, and Locations

Sampling locations will be established with input from the USEPA Region IV, and state environmental and/or health agencies for Mississippi, Alabama and Florida, evaluating areas from a western boundary at Bay St. Louis, MS to an eastern limit at Panama City, FL.

Near shore water sampling teams will utilize Vessels of Opportunity from the VOO Program to establish water sampling stations at approximately 20 mile intervals along a line paralleling the coast at a distance of approximately three miles (MS and AL) and nine miles or as otherwise provided (FL). We anticipate establishing thirteen sampling stations with a distribution proportional to the length of the coast line in each state. Overlapping coverage allows five stations to cover Alabama, five stations are proposed for Mississippi, and five stations are proposed for Florida. Sampling locations will be

established during the initial sampling event and saved in a hand-held GPS unit as a weigh-point.

Sampling stations are currently proposed for the following locations:

Location (Latitude/ Longitude)	State Waters
N30.2318/W88.3395	MS
N30.2611/ W88.7767	MS
N30.2242/ W88.9972	MS
N30.2081/ W89.1776	MS
N30.2256/ W88.3868	MS/AL
N30.2201/ W88.2160	AL
N30.2031/ W87.9686	AL
N30.2200/W87.7150	AL
N30.25510/W86.5232	AL/FL
N30.1961/ W87.4809	FL
N30.2100/W87.3025	FL
N30.0284/W85.8168	FL
N29.8984/W85.5267	FL

Daily sampling activities will be conducted to address near shore water locations on a staggered or rotational basis so that sampling is conducted at each station every other day. The data obtained from all sampling, along with any significant field observations from the collection points (e.g., sheen, odor, etc) will be provided to Incident Command, the appropriate state agencies and USEPA. We anticipate sampling under this plan to continue for a maximum of sixty days unless conditions warrant additional effort. Data and observations will be evaluated regularly during the operational period to determine if the level of effort is appropriate. We will summarize information and hold discussions with the state and federal regulatory agencies, including: Alabama Department of Environmental Management, Florida Department of Environmental Protection, Mississippi Department of Environmental Quality, and USEPA Region IV, to increase or decrease scope, including the frequency and analyte list. All plan modifications will be based on a consultation of the agencies. The final plan will be approved by the incident management team. The operational period may be increased beyond sixty days based on a determination of conditions and data at that time.

2.1 Field Sampling Procedure

Field teams, which may include representatives from state or federal regulatory agencies, will be deployed with appropriate equipment and supplies to collect near shore water quality samples and sediment samples from depths up to 90 feet. All sampling will

be documented in field notebooks and/ or with hand-held data collectors. Locations of near shore water samples will be documented with Global Positioning System (GPS) receivers. All sampling and subsequent shipping and handling of samples will be carried out following strict chain-of-custody procedures and methodology appropriate for the media and conditions.

Individual states have elected to supply water sampling and water quality devices during testing. In the event that state owned equipment is used in the field, all calibration will be the responsibility of the state representative. In circumstances where BP's contractor is providing real time water quality devices, the manufacturer's instructions will be followed to calibrate the water quality instruments. The unit(s) utilized will be YSI brand Professional Plus and will be calibrated daily during sampling events, at a minimum. Calibration will be performed by using standards of known quality. All calibration equipment will be kept clean, stored in protective cases during transportation, and protected from extreme temperatures.

All equipment calibration records, including instrument type and serial number, calibration supplies used, calibration methods and calibration results, date, time, and personnel performing the calibration will be recorded in the field notes.

2.1 Field Documentation

2.1.1 Sediment Samples

Field sample logs and notebooks will be maintained for all samples collected during the field program. All sample field notebooks will have numbered pages. All data entries will be made using indelible-ink pens. Corrections will be made by drawing a single line through the error, writing in the correct information, then dating and initialing the change. Hand-held electronic data management devices (e.g., MC55) may be substituted for paper logs.

At a minimum, the following information will be included in the log for sediment:

- The sample station number;
- Location of each sample station as determined by GPS (with proper description of measurement units);
- Date and collection time of each sediment sample;
- Names of Field Supervisor and person(s) collecting and logging the sample;
- Observations made during sample collection including: weather conditions, complications, and other details associated with the sampling effort: and,

- Any deviation from the approved SAP.

During sediment sample processing, the following information should be recorded in the sample log sheet or field log:

- Sample penetration and recovery (depth in inches of penetration and sample compaction);
- Physical description (e.g., color, consistency);
- Odor (e.g., hydrogen sulfide, petroleum, etc.) if any is passively recorded;
- Presence of vegetation;
- Presence of debris;
- Biological activity (e.g., detritus, shells, tubes, or living or dead organisms);
- Presence of oil sheen; and,
- Any other distinguishing characteristics or features.

2.2.2 Near shore water samples

Field sample logs and notebooks will be maintained for near shore water samples collected similar to the procedures for sediment collection. Hand-held electronic data management devices (e.g., MC55) may be substituted for paper logs.

At a minimum, the following information will be included in the log for near shore water grabs:

- The sample station number;
- Location of each sample station as determined by GPS (with proper description of measurement units);
- Date and collection time of each water sample;
- Names of Field Supervisor and person(s) collecting and logging the sample;
- Observations made during sample collection including: weather conditions, bayou conditions, complications, and other details associated with the sampling effort;
- Water depth and sample depth; and,
- Any deviation from the approved SAP.

2.3 Near Shore Water Sampling

Three water samples will be collected at each established station. Field parameters will be measured at each sample location (at approximately the same sample depth that the near shore water sample is collected) using a YSI Professional Plus. An aliquot of water from each sample depth will be recovered in a decontaminated glass 1-quart jar and water quality parameters recorded after allowing the probe to equilibrate for 30 seconds or until readings have stabilized. Measurements of pH, temperature, conductivity, and dissolved oxygen will be recorded. If requested individual states may elect to include additional parameters in their water quality testing (e.g., salinity), using monitoring equipment provided by the state. Additionally, individual states may elect to have water quality parameters evaluated at specific depths in addition to those previously specified, (e.g., Mississippi 5 feet). Samples from each station will be collected from the near surface ~~shore~~, from mid-depth, and from near bottom. Samples will be collected using a discrete water sampling device (e.g., Kemmerer bottle) and decanted directly into laboratory supplied containers. Sample collection vessels will be constructed of materials suitable for sampling petroleum products. Each sample container will be clearly labeled with the task name, sample number, type of analysis to be performed, date and time, and initials of person(s) preparing the sample. Immediately after sample containers are filled, the samples will be placed into a cooler on ice (4±2 C). Near shore water samples will be managed under strict chain of custody procedures established for the project and will be transported daily by courier to the project laboratory.

In the event that split samples are collected by state or federal representatives for submittal to independent third party laboratories, sample containers will be supplied by BP or its designates, if requested in advance.

Near shore water samples will be analyzed for the parameters listed in Table 1.

Table 1 – Near shore water parameters, methods, and container types

Parameter	Method	Container Size and Type
VOC	EPA 8260	3 x 40 mL VOA vials HCL to pH < 2
SVOC	EPA 8270	2 x 1 L Amber Glass
DRO/ORO 2-butoxy ethanol	EPA 8015B	1 x 1 L Amber Glass
GRO	EPA 8015	2 x 40 mL VOA vials HCL to pH < 2
Metals (TAL)	EPA 6010	1 x 150 mL HDPE bottle

Mercury	EPA 7470	HNO_3 to pH < 2
Propylene glycol	EPA 8015B	1 x 40 mL VOA vial

Note: The total number of containers per discrete sample is 10.

2.4 Sediment Sampling

Sediment samples are proposed to be collected from areas suggested by specific state agencies. Sampling is proposed to be conducted at a minimum rate of one sample per week from each state's waters. A maximum sampling frequency of one sample every other day from each state's waters would be recommended. The sampling frequency and parameters may be adjusted based on observations in the field and the results of testing conducted. Sediments will be collected from one of four State of Alabama approved oyster harvesting areas on a rotating basis. One sample will be collected every other day. Samples will be collected using a stainless steel Ponar dredge (or similar device). Sediment sampling locations within Florida waters have been requested to rotate on the following sentinel stations coordinates weekly (N30.21001/W87.30251 and N30.25510/W86.52323). We anticipate that specific areas for sediment sampling will be provided by the remaining representing agencies concurrent with approval of the Work Plan.

Material collected with the sampling device will be evaluated by the field team for acceptability using the following criteria:

- The sampler is not overfilled;
- The overlying water (if present) is not excessively turbid;
- The sediment surface is relatively undisturbed; and,
- An adequate penetration depth is attained (i.e., to enable sampling of the undisturbed surface sediment).

If a sample fails to meet any of the above criteria, it will be rejected and discarded away from the station.

After a sediment sample is judged to be acceptable, any overlying water will be decanted off and the upper two inches of sediment will be collected. Surface sediments from the grab samples will be placed into a decontaminated, glass bowl and a representative aliquot removed for VOC analysis. The remaining sediment material will be homogenized using a stainless-steel spoon or other stainless-steel mixing implement

until the sediment attains a visually uniform color and texture. A representative sediment sample will then be removed and containerized.

The surface sediment samples will be placed in labeled, laboratory-cleaned sample containers with Teflon-lined lids. Each sample container will be clearly labeled with the task name, sample number, type of analysis to be performed, date and time, and initials of person(s) preparing the sample. Immediately after sample containers are filled, they will be placed in a cooler and stored on ice (4±2 C).

In the event that split samples are collected by representatives of either state or federal regulatory agencies for submittal to independent third party laboratories, sample containers may be supplied by BP or its designates, if requested in advance.

Sediment samples will be analyzed for the parameters listed in Table 2.

Table 2 – Sediment parameters, methods, and container types

Parameter	Method	Container Size and Type
VOC	EPA 8260	1 x 4 oz. Glass
SVOC	EPA 8270	1 x 4 oz. Glass
Propylene glycol 2-butoxy ethanol	EPA 8015B	1 x 4 oz. Glass
GRO/ORO/DRO	EPA 8015	1 x 4 oz. Glass
Metals (TAL) Mercury	EPA 6010 EPA 7470	1 x 4 oz. Glass

Note: The laboratory will be able to perform all of the necessary analyses from 2-4oz glass containers per sample location. However, an additional 1-4oz glass container (for a total of 3-4oz containers per location) will be collected in case of breakage during transit.

2.6 Field Quality Control

Field sampling will be carried out in conjunction with a well defined quality control (QC) program. The goal of the field QC program is to document that samples are collected without the effects of accidental cross or systematic bias introduced by sample contamination. The following QC samples will be obtained in the field at prescribed intervals:

2.6.1 Field Sample Duplicates

One (1) duplicate field sample for metals, semi-volatile, volatile, GRO, propylene glycol, 2-butoxy ethanol, and DRO/ORO will be collected for every 20 field samples to document the reproducibility of sampling efforts.

2.6.2 Blank Analysis

For metals, SVOC, VOC, GRO, and DRO/ORO analysis, a method blank will be prepared per method with samples and analyzed per method at the laboratory. Trip blanks will be provided for VOC.

2.6.3 Rinsate Blank

Equipment rinse field blanks will be used to monitor the effectiveness of the decontamination process. Equipment rinse field blanks will be prepared by passing reagent grade, analyte free water through and over the surface of decontaminated water sampling equipment. The rinse water will be collected in sample bottles, preserved, and handled in the same manner as the samples. One rinsate blank will be collected for each day of sampling for initial sampling events. If impacted surface water is identified in sampling events the frequency of rinsate blanks will be evaluated for modification.

2.7 Field Sample Preservation and Shipping

Samples are in custody if they are in the custodian's view, stored in a secure place with restricted access, or placed in a container secured with custody seals. A Chain-of-Custody (COC) record will be signed by each person who has custody of the samples and will accompany the samples at all times. Copies of the COC will be included in laboratory and QA/QC reports. At a minimum, the form will include the following information:

- Site name;
- Field supervisor's name and team members responsible for collection of the listed samples;
- Collection date and time for each sample;
- Sample type (i.e., sample for immediate analysis or archive);
- Number of sample containers shipped;
- Requested analyses;
- Sample preservation information (if any);
- Name of the carrier relinquishing the samples to the transporter, noting date and time of transfer and the designated sample custodian at the receiving facility; and,

- All samples will be marked for expedited analysis (e.g., 24hr turn-around-time).

2.7.1 Holding Times

The holding times to be followed in this investigation are listed in Table 3.

Table 3- Sample Holding Times

Parameter	Holding Time at 4° C
Metals (TAL) Mercury	6 months 28 days
VOC GRO	7 days
SVOC DRO/ORO Propylene glycol 2-butoxy ethanol	7 days to extraction 40 days after extraction

3.0 Laboratory Analyses

3.1 Analytical Laboratory

All samples will be analyzed using a 24 hour turnaround time unless specifically indicated otherwise on the COC that accompanies the samples to the lab. Water and sediment samples will be delivered to Gulf Coast Analytical Laboratories (GCAL). Other analytical laboratories with facilities in the region may be used as required based on the number of samples collected on a daily basis, in order to maintain adequate turn-around times for data. Only pre-approved and accredited laboratories will be used for testing. Other available laboratories include Accutest Laboratories, Pace Analytical, and Test America. All are NELAC accredited laboratories.

3.2 Analytical Methods

3.2.1 Sample Preparation

Water samples will be prepared for SVOC and TPH (DRO/ORO) analysis by liquid-liquid extraction, EPA SW846 Method 3510.

Water samples will be prepared for VOC and GRO analysis by purge and trap vapor collection, EPA SW846 Method 5030.

Water samples will be prepared for TAL metals analysis by acid digestion.

3.2.2 Instrumental Analysis

Total Petroleum Hydrocarbons: Sample extracts will be analyzed for DRO and ORO by EPA SW848 Method 8015, *Nonhalogenated Organics by Gas Chromatography*.

Total Petroleum Hydrocarbons: Sample extracts will be analyzed for GRO by EPA SW848 Method 8015, *Nonhalogenated Organics by Gas Chromatography*.

Semi-Volatile Organic Chemicals: Sample extracts will be analyzed for SVOCs using gas chromatography/mass spectrometry (GC/MS) EPA SW846 Method 8270, *Semivolatile Organic Compounds by Gas Chromatography/Mass Spectrometry (GC/MS).*

Volatile Organic Chemicals: Water samples collected in 40-mL vials will be analyzed for volatile organic chemical (VOC) compounds directly by EPA SW846 Method 8260, *Volatile Organic Compounds by Gas Chromatography/Mass Spectrometry (GC/MS).*

Target Analyte List Metals and Mercury: Samples will be analyzed for TAL metals by EPA SW848 Method 6010, *Inductively Coupled Plasma-Atomic Emission Spectrometry*. Mercury will be analyzed by EPA SW846 Method 7470, *Mercury in Liquid Waste (Manual Cold-Vapor Technique).*

Propylene Glycol and 2-Butoxy Ethanol: Sample extracts will be analyzed for propylene glycol and 2-butoxy ethanol by EPA SW848 Method 8015, *Nonhalogenated Organics by Gas Chromatography*.

3.3 Data Analysis

To determine the potential impact of the crude oil release to water quality, the results of water quality sampling (i.e., VOCs, SVOCs, GRO, DRO/ORO, and metals) will be analyzed for the presence/absence of these compounds. The preliminary results of chemistry analyses from GCAL (and additional facilities as needed) will be internally provided to regulatory agencies. Final QA/QC-ed data will be posted on a CTEH web-portal and uploaded to SCRIBE.

4.0 Documentation and Submittals

Documentation for final sample results is anticipated to initially be through the USEPA Data Liaison. Immediate notification will be made to the involved parties and the US Coast Guard, if significant impact is indicated by visual observation or sample data. A

brief daily summary of available preliminary data may be provided by electronic mail message, if requested. Formal reporting may be undertaken at a future date based on assessment at that time.

5.0 Decontamination

Decontamination procedures are outlined below for sediment and surface water sampling. The sampling team leader may elect to implement a hexane or isopropyl alcohol rinse, if there are significant residues observed on field equipment after the above decontamination procedures are used. Any organic solvent investigation derived waste will be handled in accordance with the appropriate waste disposal plan.

5.1 Sediment Sampling

Sample collection equipment, containers, instruments, working surfaces, technician protective gear, and other items that may come into contact with sediment sample material must meet high standards of cleanliness. All equipment and instruments used that are in direct contact with the sediment collected for analysis will be made of glass, stainless steel, high density polyethylene (HDPE), or polytetrafluoroethylene (PTFE), and will be cleaned prior to each day's use and between sampling or handling. The decontamination procedure is as follows:

- Pre-wash rinse with tap water;
- Wash with solution of tap water and laboratory grade phosphate-free detergent (brush);
- Rinse with tap water;
- Rinse with distilled water; and,
- Store in clean, closed container for next use.

5.2 Water Sampling

To prevent sample contamination, water sampling equipment will undergo the following decontamination procedures between each sampling station:

- Wash with laboratory grade phosphate-free detergent and tap water using a scrub brush
- Rinse with deionized water and store in clean materials between uses

6.0 Safety

The safety of individuals, the community and the environment are of utmost importance in all operations. All personnel participating in the proposed effort will have completed the appropriate training for their tasks in accordance with existing project plans. Daily safety briefings will be held with sampling personnel and boat crews prior to operations and at any time that conditions change in the field. In order to protect the health and safety of these individuals operations will not be conducted when weather conditions are below acceptable standards or there are anticipated risks based on the forecast at the time of departure. All vessels used in the planned sampling activities will be provided by the BP VOO program, which utilizes local crews familiar with the waters and weather typical of the area.

Annex 2: Quality Assurance Project Plan

Center for Toxicology and Environmental Health, L.L.C.

5120 N. Shore Drive, North Little Rock, AR 72118 Phone: 501.801.8500 www.cteh.com

Quality Assurance Project Plan

Deepwater Horizon (MC-252) Incident

Original: May 12, 2010
Updated: June 13, 2010

Prepared For:
Incident Command

Prepared By:
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5120 North Shore Drive
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Table of Contents

** Update to plan was the removal of printed attachments. Data management plan submitted as a separate plan.

1. PURPOSE

This Quality Assurance Project Plan ("QAPP") has been prepared to provide assurance that community and environmental monitoring and sampling activities conducted as part of the activities related to the MC 252 oil spill meet performance goals. In addition, the methods and procedures described herein were developed in general accordance with conventionally-accepted Quality Assurance and Quality Control (QA/QC) objectives.

2. SCOPE AND OBJECTIVES

This QAPP represents the foundation of QA/QC that will be utilized to assess and verify that sampling, testing, and analysis activities are executed in a manner consistent with applicable guidance and conventional QA/QC objectives. The procedures described in the QAPP are intended to assess the data generated in terms of representativeness, precision, accuracy, completeness and comparability.

Details about the sampling methodologies can be found in the individual work plans prepared for each activity type. Much of the field sampling QA/QC methodology and rationale is described in the individual work plans and, for conciseness, is not reproduced herein. Rather, this QAPP presents the following:

- Project Organization and Responsibility
- Data Quality Objectives
- Sampling Procedures and Field Measurements
- Sample Handling, Documentation and Custody
- Quality Assurance Procedures for Laboratory Activities
- Quality Assurance Procedures for Field Activities
- Data Reduction, Assessment and Validation
- Audits
- Corrective Action

This QAPP is applicable to the work plans approved as of the date of this document. To the extent that other work plans are written and approved that this QAPP is applicable to, those activities will be incorporated by reference to the scope of the QAPP herein.

3. PROJECT ORGANIZATION AND TEAM

This section describes the project organization and specifies personnel responsibilities. The project organization presented in this section has been developed to guide and assess the quality of sampling and testing procedures for obtaining reliable data, and to facilitate effective communication and decision-making during the project.

3.1. Project Organization

The principal entities relevant to this QAPP that are involved in activities related to

the MC 252 spill, and their respective roles, include the following:

- *BP* – Responsible Party
- *Unified Command Health and Environmental Representatives* – review and approval for procedures and deliverables
- *Center for Toxicology and Environmental Health* (CTEH) – complete all site investigation work, including data validation.
- *Sampling Manager* - CTEH project manager responsible for sampling activities by region and / or by sampling matrix. (Houma water sampling manager, Mobile air sampling manager, etc.)

3.2. Responsibility for Quality Assurance and Quality Control

The responsibilities of key members of the project team are summarized in the following subsections.

3.3. Qualified Individual (QI)

BP and their representatives will have full authority to direct, supervise, and coordinate the project team, and to commit resources as deemed necessary. One or more BP designates will be the focal point of communications for contractual matters with the Project Managers and all subcontractors. The QI will oversee all project planning and will review and approve project specifications, plans, and procedures. The QI will have ultimate project responsibility for assuring that the project is completed according to plan.

3.4. Project Manager

CTEH Sampling Managers will be responsible for the preparation of project plans, specifications, and reports within their defined scope of work. The PMs will attend meetings and conferences between Unified Command and any other project participants. They will ensure that the necessary equipment, facilities, and staffing are available to implement their portion of the project.

Sampling Managers are responsible for maintaining the schedule of the work and will regularly advise the QI of the progress of the project. Each PM will provide direction to the field staff and subcontractors involved in field sampling activities within his scope so that the project is completed in accordance with the Work Plans and QAPP. The PM will consult with any subcontractors to discuss compliance with the relevant Work Plans and QAPP, and to evaluate corrective measures if problems occur.

The PM will also be responsible for the development and execution of QA/QC activities in all phases of the project, including plan design, execution, data reduction, and reporting for the scope of work. Each PM will serve as an in-house consultant to the QI in the development of a project-specific internal QC system, as well as providing an independent review of the project approach, methods and design.

3.5. Laboratory Subcontractors

Integrated air samples will be sent to Pace Analytical Services, Inc., Galson Laboratories, and Air Toxics Ltd located in Minneapolis, MN, Syracuse, N.Y, and

Folsom, CA, respectively. Galson Laboratories is AIHA Accredited, and Pace and Air Toxics are NELAP certified.

Water and beach sediment samples will be sent to Pace Analytical Services, Inc., TestAmerica and Gulf Coast Analytical Laboratory in Minneapolis, MN, Mobile, AL and Baton Rouge, LA respectively.

4. OVERVIEW OF SAMPLING ACTIVITIES

4.1. Data Quality Objectives

This section on Data Quality Objectives (DQOs) presents the intended data usage and QA objectives for the sampling and analysis that will be performed during the project. The overarching DQO is to generate validated data that is suitable for its intended use.

4.2. Intended Data Use and Objectives

The data collected during field activities will be used to characterize the chemical properties of media collected during the response. The data collected during field activities will be used to characterize potential exposures of workers and members of the public to constituents potentially related to the release of oil from MC 252 well, by reporting on chemical constituents found in the environment at the time and location of sample collection. The data may also be used to inform decisions related to appropriate protective actions necessary to ensure health and safety of members of the community and workers.

4.3. Data Quality/Measurement Objectives

The purpose of DQOs is to establish a target level that can be measured against whether data that is collected (through the sampling and analysis program) are of appropriate quality to produce documented, consistent, and technically defensible results. These results ultimately will define the characteristics and chemical constituent concentrations present at the Site.

The quality of measurements made and the data generated will be evaluated in terms of the following characteristics:

1. Representativeness
2. Precision and Accuracy
3. Completeness
4. Comparability

Specific objectives for each characteristic are established to develop sampling protocols and identify applicable documentation, sample handling procedures, and measurement system procedures. These objectives are established based on Site conditions, objectives of the project, and knowledge of available measurement systems. In addition, the following criteria for chemical sample handling and analysis will help attain the DQOs:

- Standard chain-of-custody procedures
- Analytical testing will be performed according to approved laboratory methods with data packages prepared that are consistent with Level 2 protocol (a Level 3 and 4 CLP protocol may be required in some instances).

4.4. Representativeness

Measurements will be made so that analytical results are as representative as practical of the actual field conditions. Sampling protocols will be utilized to help assure that samples collected are reasonably representative of the media present in the field. Appropriate sample handling protocols, including such tasks as storage, transportation, and preservation, will be used to protect the representativeness of the samples gathered during the project. Proper documentation in the field and the laboratory will verify whether protocols have been followed, and whether sample identification *and integrity* have been preserved.

Representativeness will be assessed also by comparing the results of duplicates to determine the spread in the analytical results. The results of QC blanks will be examined for evidence of contamination unrelated to the Site on sampling activities. Such contamination may be cause for invalidation or qualification of affected samples. Sample analytical data classified as "questionable" or "qualitative" by any of the above criteria may be invalidated.

4.5. Precision and Accuracy

Precision is a characteristic that reflects the ability to replicate a previously obtained value using identical testing procedures, while accuracy reflects the ability to obtain a value that equals, or approaches with certain predetermined limits, the true value of a certain phenomenon. DQOs for precision and accuracy are established under the CLP guidelines for each major parameter to be measured during the project.

The precision and accuracy requirements for certain data gathering and reporting activities may vary based upon the anticipated use of the information.

Accuracy measurements will be performed by the contract laboratory on fortified samples as specified in each laboratories internal Quality Assurance Program Plan. Sample and laboratory prepared duplicates (LCSD or MSD) will be collected as defined in the Work Plans. Precision of sample collection can be measured by comparing analytical results of samples and duplicate samples. The variation in results is a measure of precision. Precision can be expressed as the relative percent difference (RPD), which is determined using the formula below.

$$\% \text{ Diff} = \left| \frac{x_1 - x_2}{(x_1 + x_2)/2} \right| \times 100$$

4.6. Completeness

The precision and accuracy control limits (in terms of spike recoveries, replicate

results, etc.) that must be met for the Routine Analytical Services (RAS) analytical data to be considered acceptable are established under CLP guidelines. Laboratory QAPPs provide acceptable precision and accuracy limits for sampling activities. These control limits for accuracy and precision will be utilized to identify outliers (data results outside the specified control limits). If outliers occur or if contamination is detected in the blanks, the corresponding analytical results will be flagged.

The characteristic of completeness is a measure of the amount of valid data (or samples) obtained as compared with the amount that was specified to be obtained under normal conditions. The objective for completeness is to provide enough valid data to ensure the goals of the field investigation are met. Completeness will be evaluated for each sampling event specified relative to each activity on an individual basis.

4.7. Comparability

The characteristic of comparability expresses the confidence that one set of analytical data may be compared with another. Data sets that can be used for comparison include results of studies conducted previously in the area. Comparability is maintained by use of standard analytical methods, and units consistent with those used in previous studies. Also, the personnel involved in data acquisition and reduction must operate measurement systems within the calibrated range of the particular instrument as well as utilize analytical methodologies that produce comparable results. The comparability of field investigation tasks of (e.g., beach sediment sampling technique) will be maintained by following the applicable EPA Technical Guidance documents, and/or the applicable Work Plan.

4.8. Analytical Methods and DQOs

Analytical testing will be performed according to the methods outlined in the approved Work Plans.

5. SAMPLING PROCEDURES AND FIELD MEASUREMENTS

The objectives of beach sediment, air, and water sampling procedures and field measurements are to obtain samples and measurements that are representative of the environment being investigated. Through the use of proper sampling tools, sampling techniques, and equipment decontamination procedures, the potential for cross contamination due to trace levels of chemicals will be reduced. These procedures are described further in the individual Work Plans.

6. SAMPLE HANDLING, DOCUMENTATION, AND CUSTODY

The purpose of specific procedures for sample handling, documentation and custody is to maintain the integrity of samples during collection, transportation, analysis and reporting. These procedures are necessary to validate the history of sample data, from collection through reporting, by providing adequate documentation. The sampling handling, documentation and custody procedures are provided in the

individual Work Plans. QA/QC checks will be performed during the field activities to assess whether the procedures elaborated in the Work Plans are followed. An appointed representative will perform the QA/QC check prior to packaging the samples and transportation to the designated laboratory.

7. QUALITY ASSURANCE PROCEDURES FOR LABORATORY ACTIVITIES

Qualified laboratories will perform chemical sample analyses of samples collected under the direction of CTEH. Each laboratory maintains an internal *Quality Assurance Plan*. These plans include the respective laboratory's internal QA/QC procedures that cover all aspects of QA/QC during implementation of laboratory procedures. The technical quality systems that are described in the *Quality Assurance Plans* include the following:

- Personnel Qualifications and Training
- Demonstration of Capability
- Standard Operating Procedures
- Documentation and Record-Keeping
- Analytical Test Methods and Procedures
- Method Detection Limits
- Method Quantitation Limits and Reporting Limits
- Traceability, Preparation of Standards, and Reference Materials
- Measurement Process
- QC Samples
- Control Charting
- Performance Evaluation
- Corrective Action
- Preventative Maintenance
- Sample Handling and Management

In addition, the plan includes the following information that will be utilized for this project:

- Test Procedures and Standard Operating Procedures Performed
- Data Quality Acceptance Criteria
- Calibration and QC Requirements
- Containers, Preservation, and Holding Times
- Instrumentation, Software, and Applications
- Preventative Maintenance Schedule
- Training Certification Statements

QAPPs for each laboratory have been developed by the individual laboratory and are available upon request.

8. QUALITY ASSURANCE PROCEDURES FOR FIELD ACTIVITIES

This section describes the general QA/QC procedures related to field activities during the collection, handling, labeling, packaging, preservation, and custody of samples for chemical analysis. Specific procedures for field activities are described in the individual Work Plans. Field QA/QC samples will be used to verify that the sample collection and handling process has not affected the quality of samples that will be subjected to chemical analyses. This section discusses the preparation and collection frequency of field QA/QC samples constituting of trip blanks and duplicates. This section also provides a general guidance on maintaining QA/QC on the subsequent activities to ensure the goals of the field activities are met.

8.1. Internal Quality Control

Field QA/QC samples will follow the procedures set forth below and in accordance with the individual Work Plans. The required analyses and the amount of sample needed to complete the analyses will be evaluated prior to the initiation of the sampling event. The required quantity of sample matrix to perform all the analyses will be collected.

Co-located Samples – True duplicates of many media types are not typically possible because chemical constituents are rarely distributed uniformly in the media, even within small volumes. Therefore, some differences can be expected from "duplicate" beach sediment and water samples. For this reason, duplicate samples collected during this project will be referred to as co-located samples. They are samples that are collected at the same time and place.

Co-located samples will be collected for each media type at a rate of approximately 10% of samples collected or at least 1 duplicate sample per day per media type, whichever is greater. USEPA regions 4 and 6 have been invited to shadow field operations and will collect co-located samples at a rate that they determine necessary.

8.2. Equipment

Appropriate tools and equipment will be utilized for collecting samples during the field investigations. Using the correct equipment for sampling is important in meeting the objectives of QA/QC. Laboratory supplied equipment such as sample containers are generally uncontaminated. However, a simple visual QA/QC check of any containers in cases that were opened may identify certain potential issues. Sample labels will be clearly printed in waterproof, indelible ink and placed directly on the sample container(s).

8.3. Sampling Equipment Decontamination

Sample tools that are non-disposable will be thoroughly decontaminated prior to reuse. Decontamination procedures outlined in the individual Work Plans will be utilized. Thorough decontamination of sampling tools and adherence to appropriate QA/QC principles will reduce the potential for cross-contamination of samples and will preserve the integrity and representativeness of the field conditions.

8.4. Calibration, Operation and Maintenance

Instruments and equipment utilized for field measurements will be calibrated in accordance with the frequency requirements and instrument manufacturer's instructions. Appropriate methods and calibration material (gases, etc.) will be used and the procedures documented in the field logbooks. The field measurement instruments will be operated and maintained in accordance with the manufacturer's instructions and industry standard specifications/procedures in order to maintain the consistency and reliance of the measurement capacity of each instrument.

8.5. Supplies and Consumables

Sampling tools required for the collection of the samples will be inspected prior to the sampling event. For disposable tools, the packages in which the tools are supplied will be inspected. If there is any indication that the packages are torn or previously opened, these tools will not be utilized and will be discarded. Standard material such as sample containers, calibration gases, reagents, solutions, and deionized water will be inspected for tamper proof seals. If the seals appear to be broken, the material will not be used in the collection of the samples.

8.6. Field Documentation

Field logs, documentation forms, and calculation work sheets utilized during the field investigations will be maintained accurately and in accordance with the requirements of the individual Work Plans. Copies of field logs will be included in the project reports as appropriate.

8.7. Procedures to Assess Precision, Accuracy, Completeness and Comparability

No quantitative levels for precision and accuracy have been specified for field measurements. However, proper maintenance and operation of instruments will be followed to ensure instrument accuracy so that reliable results will be obtained. Multiple readings and analysis of duplicate samples will be performed to measure the precision of field measurements.

8.8. Corrective Action

If QA audits of data result in identification of unacceptable data, the field sampling project manager will be responsible for developing and initiating corrective action. Corrective action for sampling procedures may include evaluating and amending sampling procedures or re-sampling.

9. DATA REDUCTION, ASSESSMENT AND VALIDATION

9.1. Laboratory Data

Reduction of laboratory measurements and laboratory reporting of analytical parameters will be in accordance with the procedures specified for each analytical method (i.e., perform laboratory calculations in accordance with the method-specified procedure). Upon receipt of the laboratory data, the data will be processed according to the Data Management Plan (DMP).

9.2. Field Measurement Data

Project data personnel will perform assessment of field measurement data. Data assessment will be performed (as appropriate) by checking calibration procedures utilized in the field, evaluating duplicate and control sample analyses, and by comparing the data to previous measurements obtained at the specific location. Large variations, depending on matrix type, will be examined in association with changes in local conditions and general trends. If variations in data cannot be explained, the data will be qualified and will be used for appropriate purposes.

9.3. Data Management

Upon successful completion of the data assessment process, the data generated for the investigations will be stored in a central location and/or database. Data summaries and results will be submitted in accordance with the DMP. Further data management details are provided in the DMP.

9.4. Data Validations

All data packages will receive a data package completion check from the corresponding laboratory generating the data package to ensure that the deliverable requirements specified for this project have been satisfied. Third party data reviews will be conducted on all data as the data are received to assess whether the QC criteria established for the associated analytical methods established for this project have been met. In addition, third party data Level IV validation will be conducted on a minimum of 10 percent of the data packages generated. Further details about data validation are included in the DMP.

10. AUDITS

Quality assurance audits will be performed to assess whether the QA/QC measures are being utilized to provide data of acceptable quality. Further, audits will be completed to verify that subsequent calculation, interpretation, and other project outputs are checked and validated.

10.1. Field Systems Audit

Field auditors will visit field sampling teams periodically to observe the designated control procedures that are set forth in this document and in the individual Work Plans. These audits will address whether field tools, analytical instruments, and reporting processes are selected and used to meet the requirements specified by the project objectives stated in this plan and other project Work Plans. Equipment and facilities provided for personnel health and safety will also be evaluated. Calibration and documentation procedures for instruments used in the field will receive special attention. Field documentation and sample custody records will be reviewed. During the audit, the sampling manager will review data handling procedures with the appropriate personnel. Accuracy, consistency, documentation, and appropriate selection of methodologies will be discussed.

10.2. Laboratory Audit

Laboratory audit procedures are described in the DMP.

11. CORRECTIVE ACTION

Corrective or preventive action is required when potential or existing conditions are identified that may have an adverse impact on data quality. Corrective action can be immediate or long term. In general, any member of the project staff who identifies a condition adversely affecting quality can initiate corrective action by notifying in writing their supervisor or the sampling manager. The written communication will identify the condition and explain how it may affect data quality.

Corrective action in the field is the responsibility of the on-site staff. This includes reviewing the procedures to be followed prior to sampling events and checking the procedures taking place after the sampling event is completed. Corrective action with regard to laboratory analyses are the responsibility of the selected laboratory.

11.1. Immediate Corrective Action

This type of corrective action is usually applied to spontaneous, nonrecurring problems, such as instrument malfunction. The individual who detects or suspects nonconformance to previously established criteria or protocol in equipment, instruments, data, methods, etc., will immediately notify his/her supervisor. The supervisor and the appropriate task leader will then investigate the extent of the problem, if any, and take necessary corrective steps.

If a large quantity of data is affected, the sampling manager must prepare a memorandum to the QI. These individuals will collectively decide on a course of action to correct the deficiencies while the project continues to proceed. If the problem is limited in scope, the task leaders will decide on a corrective action measure, document the solution, and notify the sampling manager.

11.2. Long-Term Corrective Action

Long-term corrective action procedures are devised and implemented to reduce the potential for the recurrence of a potentially serious problem. The sampling manager and the QI will be notified of the problem and will conduct an investigation to determine the severity and extent of the problem. Corrective actions may be initiated as a result of other activities such as audits.

The sampling manager will be responsible for documenting all notification, recommendations, final decisions, and notifying project staff and implementing the agreed upon course of action. The development and implementation of preventive and corrective actions will be timed, to the extent possible, to minimize any adverse impact on project schedules and subsequent data generation/processing activities. However, scheduling delays will not override the decision to correct the data collection deficiencies before proceeding with additional data collection. The sampling manager also will be responsible for developing and implementing routine

program controls to minimize the need for corrective action.

Annex 3: Situation Team Reporting Sheet

Situation Team Reporting Sheet **Deepwater Horizon–Mobile _____**

a. Date of Call:		**b** Time of Call:		**c**. Call Taker:	
d. Reporter Name:				e. Reporter Phone#	
f. If vessel reporting, insert name of vessel, Captain's Name and phone number					
g. Geographic Location:					
h. GPS Coordinates:	North		West		
i. What are the coordinate units?	☐Decimal degrees ☐Degrees decimal minutes ☐Degrees minutes seconds				
j. City:		**k**. County:		**l**. State:	

m. Type: (Check all that apply)

Where is the oil located?
☐ Oil Onshore ☐ Oil Offshore ☐ Oil Nearshore

Which of the following form of oil do you see?
☐ Tarball ☐ Mousse ☐ Oily Mat ☐Oiled Debris ☐ Floating Oiled Vegetation

☐Oil Sheen {☐ Heavy Sheen ☐ Light Sheen (Length and width of sheen)_____}

☐Submerged or Benthic Oil (Oil on Seafloor)

What is the color of the oil? _____

Is there a smell?
☐ Heavy Smell ☐ Medium Smell ☐ Light Smell

Were pictures taken of the oil? _____ (If yes, please have them email to Call Center email.)

Can you estimate currents or direction oil seemed to be drifting? _____

Other
☐ Public Info – JIC ☐ Public ☐ Information ☐ Debris ☐ Boom ☐ Other ☐ Vessel Decon

n. Description:

Annex 4: BMP Checklist for On-Water Operations

SECTION 7 FEDERAL AGENCY ACTION – ENDANGERED SPECIES ACT COMPLIANCE
Deepwater Horizon (MC-252) Response
Mobile Sector

On-water Operations		
Date:	Task Force:	Approximate Number of Vessels in TF:
General Location:	Description of Activity:	Lat/Long (dd mm.mm):

	(Y/N)	Corrective Action* (Y/N)	Completed by: (ICS Position / Printed Name / Signature / Date)
BMP 2			All live and dead turtles should be recorded and retrieved (if possible). Retrieve injured/dead/oiled sea turtles using the Sea Turtle At-Sea Retrieval Protocol.
BMP 14			If skimming, avoid skimming sargassum that is not oiled or is only very lightly oiled
BMP 15			If a sea turtle or marine mammal is observed trapped or entangled in a boom(s), open the boom carefully until the animal leaves on its own
BMP 16			Monitor under water equipment/booms to prevent fish/wildlife entrapment
BMP 17			Do not block major ingress/egress points in channels, rivers, passes, and bays.
BMP 18			A trained Sea Turtle Observer is required for all in-situ burn operations
BMP 19			For in-situ burn operations, the Sea Turtle Observer on the ignition vessel will monitor 3 areas prior to the burn (the area in front of the trawlers, oil concentrated in the boom, and any oil trailing behind the boom).
BMP 20			A survey should be conducted in the burn area after the burn is complete and all dead sea turtles should be counted and, if possible, collected
BMP 21			Avoid burning unoiled/lightly oiled sargassum (e.g. seaweed).
BMP 24			Turtle excluder devices (TEDS) should be installed in all trawl nets

* Describe reasons for not implementing BMP and any corrective actions that were taken:

Instructions for Reporting

- Before conducting Operations review all BMP's on the Checklist
- Conduct Operations
- Fill out Checklist and document if any divergence from the BMP's occurred
- Email Checklist or fax to:
  - DocumentationUnit@bp.com
  - FW4Section7OilSpill@fws.gov
  - NMFS.ser.mobile.reports@noaa.gov
  - mc252mobilewildlifeplanning@bp.com
  - Fax # 251-344-5025